

7 January 2002

CRUISE RESULTS  
Fisheries Research Vessel Albatross IV  
Cruise No. AL 01-11  
Ecosystems Monitoring Survey

CRUISE PERIOD AND AREA

The cruise period was from 29 October to 16 November 2001. The research vessel Albatross IV covered the Mid-Atlantic Bight, Southern New England, Georges Bank and Gulf of Maine regions (Figure 1) for the Late Fall Ecosystems Monitoring Survey.

OBJECTIVES

The primary objective of the cruise was to assess the impact of changing biological and physical properties of the Mid-Atlantic Bight, Southern New England, Georges Bank and Gulf of Maine portions of the Northeast Continental Shelf ecosystem which influence the sustainable productivity of the living marine resources.

Secondary objectives of this cruise were:

- the analysis of phytoplankton samples for nitrogen stable isotope ratios,
- collection of samples for zooplankton genome studies,
- the examination of plankton samples at sea for concentrations of *Calanus finmarchicus* to correlate with right whale sightings,
- 1 meter MOCNESS discrete depth sampling to study advection of this species into the Gulf of Maine
- a bongo-video plankton recorder sampling comparison for the examination of differences in data collected by these different technologies.

METHODS

The survey consisted of 120 randomly distributed stations at which the vessel stopped to lower instruments over the side.

Key parameters which were measured included water column temperature and salinity, ichthyo and zooplankton composition, abundance and

distribution; along-track temperature, salinity, chlorophyll-a fluorescence and standard weather observations.

A double oblique tow using the 61-centimeter Bongo sampler and a CTD was made at all stations. The tow was made to approximately 5 meters above the bottom, or to a maximum depth of 200 meters, at a ship speed of 1.5 knots. Plankton sampling gear consisted of a 61-centimeter mouth diameter aluminum bongo frame with two 333-micron nylon mesh nets. A 45-kilogram lead ball was attached by an 80 centimeter length of 3/8-inch diameter chain below the aluminum Bongo frame to depress the sampler. A digital flowmeter was suspended within the mouth of each sampler to determine the amount of water filtered by each net. The plankton sampling gear was deployed over the port stern quarter of the vessel by means of a conducting-cable winch and a boom. Plankton samples were preserved in a 5 percent solution of formalin in seawater. Tow depth was monitored in real time with a Seabird CTD profiler, which was hard-wired to the conductive towing cable, providing simultaneous depth, temperature and salinity data for each plankton tow.

Continuous monitoring of the seawater temperature, salinity, and chlorophyll-a level, at a depth of 2 meters was done along all of the cruise track by means of a thermosalinograph, and a flow-through fluorometer.

The thermosalinograph and flow-through fluorometer were connected to the Scientific Computing System installed in the laboratory area of the vessel by Atlantic Marine Center personnel. This system recorded output from the thermosalinograph, and the fluorometer every ten seconds, and gave the data records a time-date stamp from the GPS unit.

Samples for Seabird salinity data calibration were obtained on the 12-6 watch by taking a water sample from 30 or more meters depth using a 1.7 liter Niskin bottle at every fifth or sixth station. Calibration of the thermosalinograph and fluorometer from the surface flow-through system was undertaken on the 6-12 watch following the protocol outlined in the Ecosystem Monitoring Program Operations Manual.

Phytoplankton samples for nitrogen stable isotope ratio analysis were collected from the discharge water of the near-surface flow-through system. Six hundred to one thousand milliliters of seawater were pre-filtered through 300 micron mesh nitex gauze to remove most zooplankton, then filtered through a Whatman GFF glass-fiber filter and immediately frozen, for analysis ashore.

## RESULTS

A summary of routine survey activities is presented in Table 1. Figure 1 shows the areal coverage achieved during the cruise. The Albatross IV sailed punctually at 1400 hours EST on Monday, October 29

and proceeded south to commence sampling operations in the Mid-Atlantic Bight. While en-route to the first station, the Albatross IV diverted from its cruise track to respond to a Coast Guard call for assistance in searching for a sinking lobster boat off the Rhode Island coast. Assisted by the Delaware II, the Albatross searched the Rhode Island waters from 1800 to 2400 without success. The Albatross resumed its southerly course in the early morning hours of October 30 and reached the first station at the northern edge of the Mid-Atlantic Bight by around noon. The Albatross IV proceeded south, taking advantage of excellent weather and picking up stations on the offshore portion of the continental shelf. By October 31 the southernmost station off of Cape Hatteras had been reached and the vessel started working its way back north along the inshore portion of the shelf. The Albatross returned to Woods Hole on November 5 after completing the southern portion of the cruise in one week due to excellent weather and no problems or diversions other than the search for the missing lobsterman. Plans for a quick turn-around to exchange two NMFS staff, embark three URI scientists and sail the next day were foiled with the arrival of a low pressure system having 30-40 knot winds that kept the vessel in port until Thursday, November 8. This development dimmed hopes that the cruise would be completed early enough to allow time for a bongo-VPR comparison at the end. The Albatross IV sailed for Georges Bank at 0900 EST on 8 November, zig-zagging its way across the Bank and covering all stations from the northern to southern flanks as it proceeded eastward. Weather started out well but deteriorated by 10 November as 30 knot plus winds greatly slowed vessel progress from the middle of Georges Bank to the northeast peak and on into the Gulf of Maine. A pattern of diminishing winds during the day, and strengthening winds at night continued until 13 November when a high pressure system brought good weather for the remainder of cruise. Cruise progress increased as the wind diminished, allowing all stations to be completed before the vessel returned to Woods Hole. Although all stations were completed, no time was available for any bongo-VPR comparison tows. This was the only objective of cruise AL 01-11 that was not met. Sampling operations were completed aboard the Albatross IV on Thursday, November 15 and the vessel tied up at the NMFS dock in Woods Hole at 0800 on 16 November.

#### DISPOSITION OF SAMPLES AND DATA

All samples and data, except for the nitrogen and carbon isotope samples, the zoogen samples and the Calanus and CTD data, were delivered to the Ecosystems Monitoring Group of the NEFSC, Narragansett, RI, for quality control processing and further analysis. The nitrogen and carbon isotope samples were kept frozen and delivered to Rick McKinney at the US EPA Lab in Narragansett, RI. The zoogen samples were picked up from the vessel by Nancy Copley from Woods Hole Oceanographic Institute. The CTD data was delivered to the Oceanography Branch of the NEFSC, Woods Hole, MA, and the Calanus data was forwarded to Patricia Gerrior at NMFS in Woods Hole, MA.

SCIENTIFIC PERSONNEL

National Marine Fisheries Service, NEFSC, Narragansett, RI

Jerome Prezioso<sup>1,2</sup>, Chief Scientist  
Jacquelyn Anderson<sup>1,2</sup>  
Joseph Kane<sup>1,2</sup>  
Cristina Bascunan<sup>1</sup>  
Carolyn Griswold<sup>2</sup>

University of Rhode Island, Graduate School of Oceanography,  
Narragansett, RI

Maria Casas<sup>2</sup>  
Niele DiNitto<sup>2</sup>  
Whitely Saumweber<sup>2</sup>

<sup>1</sup>/Personnel on Leg I (29 Oct. - 5 Nov.)  
<sup>2</sup>/Personnel on Leg II (8 - 16 Nov.)

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For further information contact:  
Sharon MacLean, Group Leader, Ecosystem Monitoring Group,  
National Marine Fisheries Service, Northeast Fisheries Science Center,  
Narragansett, RI 02882.  
Tel (401) 782-3258 FAX (401) 782-3201; INTERNET "sharon.maclean@noaa.gov".  
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Table 1. STATION OPERATION REPORT FOR CRUISE AL0111

CAST	STA.	Date (GMT)				TIME (GMT)	LAT	LONG	DEPTH	OPER.
		mm	dd	yy		hr min			(m)	(b=bongo w=water z=zoogen C=carbon N=nitrogen CO=Calanus observed)
001	001	10	30	01		17 27	3937.6	7319.6	37	w
002	001	10	30	01		17 35	3937.3	7319.6	37	b
003	002	10	30	01		19 29	3921.4	7306.6	61	b
004	003	10	30	01		20 24	3913.6	7308.8	63	b,z1
005	004	10	30	01		21 58	3903.4	7321.5	60	b
006	005	10	31	01		1 14	3831.9	7336.5	69	b
007	006	10	31	01		2 37	3820.1	7341.6	114	b
008	007	10	31	01		6 31	3754.2	7420.4	65	w
009	007	10	31	01		6 39	3754.1	7420.4	65	b
010	008	10	31	01		7 50	3743.6	7416.6	106	b,N1,C1
011	009	10	31	01		9 35	3733.7	7432.0	63	b
012	010	10	31	01		10 57	3731.6	7448.2	40	b
013	011	10	31	01		12 34	3715.4	7450.1	49	b
014	012	10	31	01		13 57	3704.6	7500.6	39	b
015	013	10	31	01		20 40	3549.8	7507.8	31	b,Z2
016	014	10	31	01		23 43	3613.8	7526.4	31	b,N2
017	015	11	1	01		1 10	3625.3	7533.4	24	b
018	016	11	1	01		3 17	3642.3	7519.8	20	b,Z3
019	017	11	1	01		4 29	3652.4	7517.7	29	b,N3
020	018	11	1	01		8 30	3733.3	7512.9	29	b
021	019	11	1	01		10 12	3742.9	7529.8	15	b,N4
022	020	11	1	01		13 24	3803.3	7458.3	21	b
023	021	11	1	01		15 35	3820.7	7444.7	27	b
024	022	11	1	01		16 47	3824.9	7432.3	29	w,Z4
025	022	11	1	01		16 56	3824.8	7432.1	30	b
026	023	11	1	01		19 29	3843.7	7451.7	17	b,N5
027	024	11	1	01		21 16	3845.0	7429.2	23	b
028	025	11	1	01		22 42	3846.4	7412.3	44	b
029	026	11	2	01		0 24	3903.1	7413.9	29	b
030	027	11	2	01		2 27	3912.2	7350.3	44	b
031	028	11	2	01		4 17	3928.9	7350.3	32	b,Z5
032	029	11	2	01		6 14	3947.2	7351.7	25	w
033	029	11	2	01		6 22	3947.2	7351.7	25	b
034	030	11	2	01		7 34	3952.9	7340.9	30	b
035	031	11	2	01		11 11	4027.9	7355.6	15	b,Z6,N6
036	032	11	2	01		15 22	4028.5	7301.2	34	b,N7,C2
037	033	11	2	01		17 37	4008.1	7307.6	42	w
038	033	11	2	01		17 46	4008.2	7307.7	42	b
039	034	11	2	01		19 12	3956.0	7314.1	72	b
040	035	11	2	01		21 12	3946.1	7252.9	70	b
041	036	11	2	01		22 49	3930.6	7256.0	60	b
042	037	11	3	01		1 49	3948.5	7224.1	77	b,N8

Table 1. STATION OPERATION REPORT FOR CRUISE AL0111 (continued)

CAST	STA.	Date (GMT)				TIME (GMT)	LAT	LONG	DEPTH (m)	OPER.
		mm	dd	yy	hr min					
043	038	11	3	01	4 34	4014.5	7233.7	55	b	
044	039	11	3	01	7 38	4043.1	7219.3	39	w	
045	039	11	3	01	7 46	4043.3	7219.3	39	b	
046	040	11	3	01	10 53	4015.8	7201.6	63	b	
047	041	11	3	01	12 56	3959.8	7148.8	92	b	
048	042	11	3	01	14 48	4004.7	7127.2	90	b,Z7	
049	043	11	3	01	16 11	4000.0	7114.1	259	b,Z8	
050	043	11	3	01	16 38	4000.8	7114.6	234		
051	044	11	3	01	18 5	4010.8	7104.6	130	b	
052	045	11	3	01	19 41	4014.9	7122.5	85	b	
053	046	11	3	01	21 22	4029.8	7131.2	73	b	
054	047	11	4	01	0 23	4100.0	7143.6	43	b,N9	
055	048	11	4	01	2 57	4048.8	7114.1	59	b	
056	049	11	4	01	4 10	4042.7	7101.7	59	b,Z9	
057	050	11	4	01	6 23	4027.0	7041.4	77	w	
058	050	11	4	01	6 32	4026.9	7041.3	78	b	
059	051	11	4	01	9 52	4011.6	7005.4	100	b,Z10	
060	052	11	4	01	13 3	4019.7	6926.6	74	b	
061	053	11	4	01	14 18	4024.2	6913.0	80	b	
062	054	11	4	01	16 30	4042.4	6930.7	46	b	
063	055	11	4	01	17 54	4045.1	6947.0	40	b	
064	055	11	4	01	18 0	4045.1	6946.9	40	b	
065	056	11	4	01	20 5	4033.6	7009.8	57	b	
066	057	11	4	01	22 10	4053.9	7005.3	26	b	
067	058	11	4	01	23 25	4054.5	7023.5	45	b,N10	
068	059	11	5	01	1 3	4111.9	7022.7	30	b,N11	
069	060	11	5	01	3 14	4058.5	7044.0	49	b	
070	061	11	8	01	23 45	4043.6	6852.3	59	b	
071	062	11	9	01	2 37	4057.2	6829.8	41	b	
072	063	11	9	01	3 53	4052.6	6816.9	50	b	
073	064	11	9	01	7 19	4019.6	6817.1	144	w	
074	064	11	9	01	7 25	4019.7	6817.4	143	b,Z11	
075	065	11	9	01	10 8	4023.2	6747.3	148	b,N11	
076	066	11	9	01	12 18	4041.4	6755.5	80	b	
077	067	11	9	01	14 3	4054.8	6747.4	60	b	
078	068	11	9	01	15 57	4042.6	6728.9	89	b	
079	069	11	9	01	18 8	4038.9	6703.7	214	w	
080	069	11	9	01	18 15	4038.9	6703.6	307	b	
081	070	11	9	01	20 24	4053.9	6652.7	90	b	
082	071	11	9	01	23 14	4104.3	6709.2	64	b	
083	072	11	10	01	2 13	4109.9	6724.8	54	b	

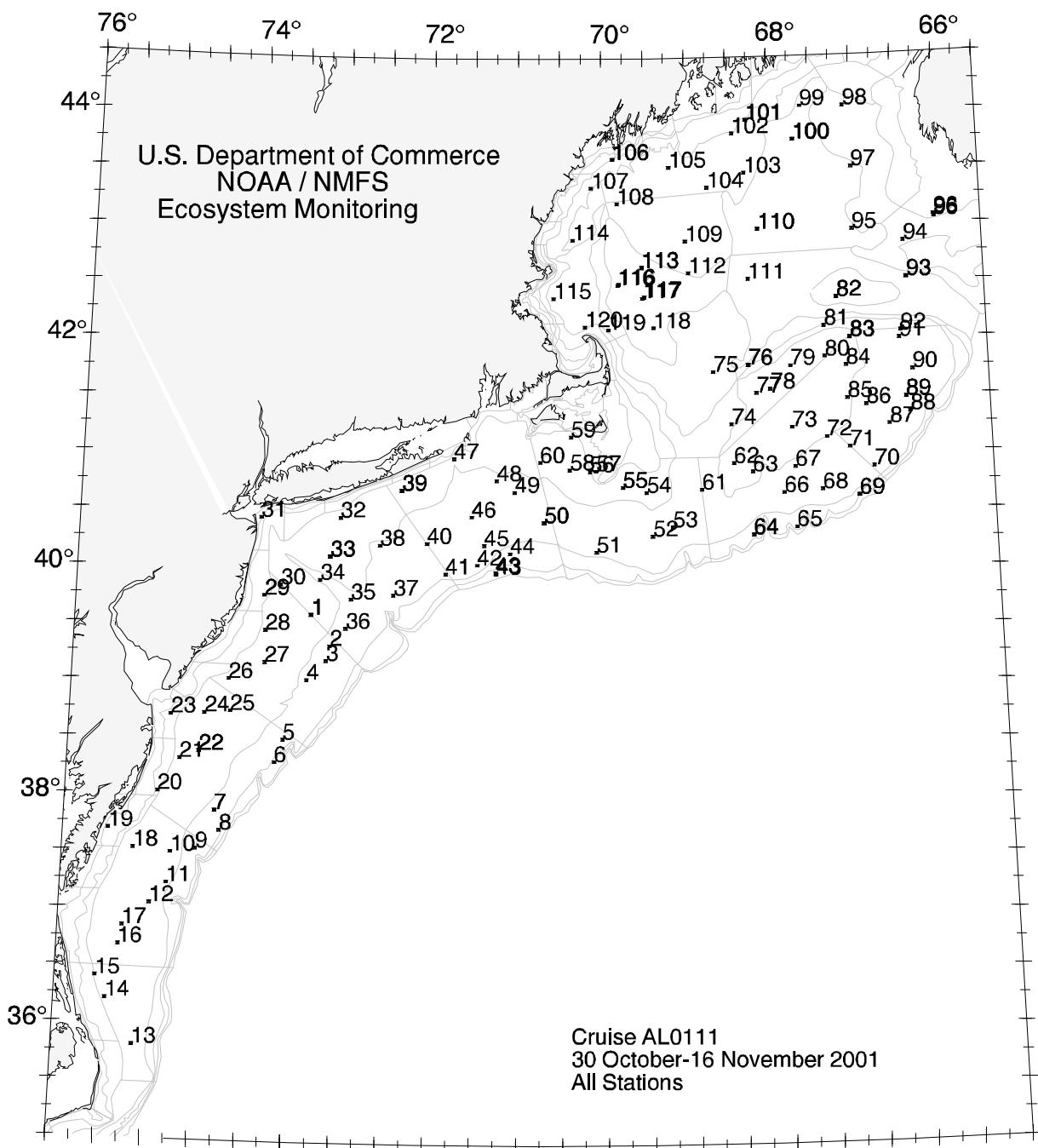
Table 1. STATION OPERATION REPORT FOR CRUISE AL0111 (continued)

CAST	STA.	Date (GMT)			TIME (GMT)	LAT	LONG	DEPTH	OPER.
		mm	dd	yy	hr min			(m)	
084	073	11	10	01	6 42	4115.3	6748.9	40	b,N12,C3
085	074	11	10	01	11 58	4117.4	6830.9	58	b
086	075	11	10	01	15 11	4145.0	6842.8	170	b,CO
087	076	11	10	01	17 25	4148.2	6818.2	156	w
088	076	11	10	01	17 33	4148.3	6818.2	165	b,N13
089	077	11	10	01	19 30	4133.5	6812.9	39	b
090	078	11	10	01	20 28	4135.4	6803.2	37	b,Z13
091	079	11	10	01	22 0	4147.5	6748.8	36	b
092	080	11	10	01	23 49	4151.9	6724.4	57	b,Z14
093	081	11	11	01	1 35	4207.8	6724.4	151	b
094	082	11	11	01	3 31	4222.7	6714.8	336	
095	082	11	11	01	3 54	4222.8	6714.8	333	b
096	083	11	11	01	8 16	4201.3	6706.2	43	w
097	083	11	11	01	8 25	4201.6	6706.5	44	b
098	084	11	11	01	10 26	4147.1	6709.7	54	b
099	085	11	11	01	12 33	4129.7	6709.5	54	b
100	086	11	11	01	13 38	4126.2	6656.6	64	b
101	087	11	11	01	15 15	4115.7	6640.8	77	b,N14
102	088	11	11	01	16 39	4121.7	6626.1	92	b,Z15
103	089	11	11	01	17 52	4129.6	6628.7	92	w
104	089	11	11	01	18 3	4129.5	6628.6	92	b
105	090	11	11	01	20 18	4143.8	6623.3	77	b
106	091	11	12	01	2 2	4200.4	6631.6	79	b,N15
107	092	11	12	01	3 32	4204.2	6630.5	82	b
108	093	11	12	01	9 13	4232.0	6624.7	220	w
109	093	11	12	01	9 26	4232.3	6624.7	215	b
110	094	11	12	01	11 58	4251.0	6625.8	139	b
111	095	11	12	01	14 56	4258.1	6702.0	206	b,CO
112	096	11	12	01	19 23	4303.3	6603.2	108	w
113	096	11	12	01	19 31	4303.5	6603.1	97	b
114	096	11	12	01	19 51	4304.3	6603.2	93	b
115	097	11	13	01	4 2	4330.7	6701.0	209	b,N16
116	098	11	13	01	11 5	4403.0	6705.4	145	b,CO
117	099	11	13	01	13 35	4403.5	6736.2	200	b,Z16,CO
118	100	11	13	01	15 41	4346.1	6742.4	232	
119	100	11	13	01	15 57	4346.0	6742.2	231	b,CO
120	101	11	13	01	19 39	4356.6	6815.9	100	w
121	101	11	13	01	19 46	4356.7	6816.0	103	b,CO
122	102	11	13	01	20 56	4349.7	6826.1	130	b,CO
123	103	11	13	01	23 21	4328.8	6818.0	171	b,CO
124	104	11	14	01	1 34	4321.4	6844.7	81	b,CO

Table 1. STATION OPERATION REPORT FOR CRUISE AL0111 (continued)

CAST	STA.	Date (GMT)			TIME (GMT)		LAT	LONG	DEPTH (m)	OPER.
		mm	dd	yy	hr	min				b=bongo w=water Z=zoogen C=carbon N=nitrogen CO=Calanus observed)
125	105	11	14	01	3	48	4332.3	6911.8	134	b,Z17,CO
126	106	11	14	01	6	55	4336.7	6952.3	79	w
127	106	11	14	01	7	2	4336.8	6952.3	79	b
128	107	11	14	01	8	59	4321.9	7007.6	82	b,N17
129	108	11	14	01	10	40	4313.5	6949.3	170	b,Z18
130	109	11	14	01	14	51	4253.4	6901.0	137	b
131	110	11	14	01	18	41	4259.2	6809.3	193	w
132	110	11	14	01	18	50	4259.2	6809.3	185	b
133	111	11	14	01	22	51	4233.1	6817.0	187	b,N18,C4,Z19
134	112	11	15	01	2	14	4236.7	6859.2	207	b
135	113	11	15	01	4	54	4239.9	6932.2	241	w
136	113	11	15	01	5	10	4240.0	6932.2	242	b
137	114	11	15	01	9	12	4254.7	7021.1	119	b
138	115	11	15	01	12	29	4224.0	7034.5	87	b,N19
139	116	11	15	01	15	54	4231.4	6948.5	260	b
140	116	11	15	01	16	16	4230.9	6949.3	243	
141	117	11	15	01	17	53	4224.6	6930.5	255	w
142	117	11	15	01	18	14	4224.5	6930.4	244	b
143	117	11	15	01	18	45	4233.9	6931.6	244	b
144	118	11	15	01	21	49	4208.4	6924.3	200	b
145	119	11	16	01	0	18	4207.6	6956.1	105	b,Z20
146	120	11	16	01	1	35	4209.1	7012.5	49	b,N20

TOTALS: Bongo Casts = 120  
 Bongo Samples = 240  
 Water Samples = 19  
 CTD Casts = 146  
 Nitrogen samples = 20  
 Carbon samples = 4  
 Zoogen samples = 20  
Calanus observations = 10



**Figure 1.** Station locations numbered consecutively for Late Fall Ecosystems Monitoring Cruise AL 01-11, 30 October - 16 November 2001.